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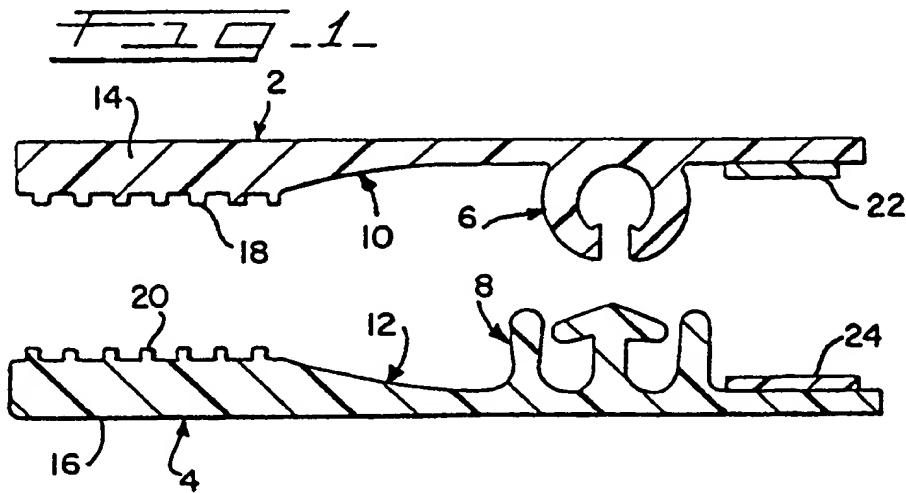
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(54) Method of producing a sealing system for a reclosable film wall package, and system made.

(57) The disclosure relates to a closure system for a film wall package including profile strips (2,4) having a reclosable seal (6,8) of the interlocking type, flange elements (10,12) and, adjacent the reclosable seal, an adhered strip of peelable material (22,24). The peelable material (22,24) and the profile strip (2,4) may be co-extruded. With packaging film attached to the profile strips, typically to the flange elements, the resulting product may be used in a horizontal form,

fill and seal operation, at which time the reclosable elements are mated and a peel seal is formed. The peel seal may be disposed on either side of the reclosable seal with respect to the interior of the package. The benefits of both peel seals and reclosable seals may be obtained by using optimum materials for those elements while, at the same time, allowing the use of a different material for the walls of the package.



EP 0 398 731 A2

The current invention relates to methods of forming a sealing system for a reclosable package, and the package made. In particular, it relates to a system for a package having walls of film or the like, typically formed from one or two webs sealed at the edges, the package having a reclosable seal and a peel seal.

There has been recent interest in expanding the use of reclosable seals of the interlocking type, which typically are of the rib and groove type often informally called a zipper.

Seals of this type are disclosed in U.S. Patents 2,978,769 of Harrah, 3,198,228 of Naito and 4,212,337 of Kamp.

Zipper seals may be manufactured in advance as elements that may be called "profile strips" and later attached to webbing, as shown in U.S. Patent 3,948,705 of Ausnit. In the alternative, the seals may be co-extruded together with one or more film members that will form the walls of the package.

It is presently preferred for such profile strips to be manufactured of polyethylene. Not only is polyethylene less expensive than many other materials typically used in this technology, but it does not take a strong set. That is, when manufactured in advance the profile strips may be wound on a spool or the like and, when unwound later, do not strongly tend to resume the wound shape. This provides a significant advantage.

Also in the past, packages have been provided having additional seals to complement interlocking seals. Such packages are shown in U.S. Patents 3,181,583 of Lingenfelter (rupturable tear line) and 4,246,288 of Sanborn, Jr. (hermetic seal).

Second seals specifically made of peelable material are shown in U.S. Patents 4,782,951 of Griesbach et al. (used in connection with interlock closure strips 14) and 4,786,190 of Van Erden et al. (used in combination with reclosable pressure sensitive adhesive 29).

Especially in the case where peelable material is used to provide a seal, it is desirable to minimize the amount of such material used. It is costly in comparison to other seal materials used in this technology.

As known in the art, the so-called "peelable material" referenced above is used to make a non-reclosable seal called a "peel seal". Certain materials, typically of resinous composition, are known to react in such a manner that they can be used in combination either with a dissimilar material or with additional material of the same composition to produce such seals. Therefore, whether or not a seal is peelable depends upon the materials used. This specification uses the term "peelable material" to describe a single element of such material, but it will be understood by those skilled in the art that the term refers to such a material when used

together with additional material of the same or different composition in order to produce a peel seal.

The current invention includes a method of producing a sealing system for a package, the method comprising the steps of forming first and second profile strips, each strip comprising a longitudinally-extending reclosable seal element of the interlocking type and adhering a strip of peelable material to at least one of the profile strips substantially parallel to and proximate the reclosable seal means. It is presently preferred that the peelable sealing system be produced by co-extruding the profile strip and the adhered peelable material.

A package having such a sealing system will enjoy the benefits of two separate seals: a reclosable seal offering the benefits of a standard profile seal and a non-reclosable peel seal offering the benefits of such seals.

Typically, the peelable material would be heat-sealed together at a time later than the time of manufacture of the sealing system, and most typically following the introduction of contents to a packaging web during a horizontal form, fill and seal operation. However, variations are possible.

Also typically, the two interlocking seals would be joined together shortly after manufacture and the resulting zipper rolled on a spool. At a later time, the two profile strips will be joined to one or two webs of film to form the walls of the package. (In known manner, whether one or two webs of film are used to form the walls of the package will depend upon whether a single web is folded over to form two walls.) However, if desired the profile strips and the container walls may be co-extruded together.

The current invention also pertains to the product made by a process such as those described above.

The profile strips may include flange elements used for subsequent joining to film layers that form the walls of the package. The flanges disclosed herein take the form of flange elements having thickened sections to form a heat barrier as disclosed and claimed in EA-A-90304405.5 the disclosure of which is hereby incorporated by reference.

An advantage of using separate strips for the reclosable seal means is that one is not as limited by the composition of the materials used, and may sometimes use a less expensive material for the seal while attaining superior performance. For example, a preferred material for use in packing meat is an ionomer resin from du Pont marketed under the trademark SURLYN®. Yet, as explained above, it is presently preferred to manufacture a profile strip from polyethylene. The use of reclosable profile strips with SURLYN® is described in

commonly-owned U.S. Patent Application Serial No. 07/353,993, of Wegner, Tomic, Kolosso and Simonsen, filed May 19, 1989, the disclosure of which is hereby incorporated by reference.

An advantage of using a reclosable profile strip is that it provides a durable reclosable seal that is more desirable for certain applications than other reclosable seals such as adhesive seals. A further advantage of the current invention is that in certain cases, package size may be reduced.

Figure 1 is a cross-sectional elevation of a first embodiment of profile strips according to the current invention, shortly after manufacture and before being joined together;

Figure 2 is a cross-section of a second embodiment of profile strips according to the current invention, before being joined together; and

Figure 3 is a fragmentary cross-section of a package according to the current invention and showing a seal made from the second embodiment described above, before being opened for the first time.

Shown in Figure 1 are cross-sections of profile strips 2, 4 respectively having formed thereon interlocking reclosable seal means elements 6, 8. To the left of the elements 6, 8 in Figure 1 are flange elements 10, 12 having distal ends in the form of thickened sections 14, 16. Preferably, the sections 14, 16 have formed thereon ridges 18, 20. The functions of the elements 14-20 will be described briefly later and is described in greater detail in the above-mentioned EP-A-90304405.5.

The interlocking seal means 6, 8 extend longitudinally of the profile strips 2, 4. First and second strips 22, 24 of peelable material also extend longitudinally of the profile strips, substantially parallel to and proximate the reclosable seal means 6, 8. It will be understood that, at some point before a package embodying the sealing system is completed, the strips of peelable material 22, 24 will be heat-sealed together to form a peel seal 26 as shown in Figure 3.

It is preferred that the adherence of the strips 22, 24 to the profile strips 2, 4 be attained by co-extrusion of the profile strip with adhered peelable material. The material of the profile strips 2, 4 is preferably polyethylene but may be another known material for such use. Typically, the peel seal material may be made using SURLYN®. In particular, the peelable material may be made from one hundred percent virgin SURLYN® ionomer resin with additives blended-in or a product presently commercially known as SURLYN® 8414-1. In the alternative, a non-SURLYN® peelable material may be made by blending certain grades of polybutylene with ethylene vinyl acetate copolymer, or polyethylene, or both. An example of such polybutylenes are various grades marketed as DURAFLEX® by

Shell Chemical Company, Polybutylene Business Center, Houston, Texas.

The use of other peelable materials may be possible. Those set forth above are presently thought to be the most common. Nevertheless, the current invention is applicable to any extrudable peel seal material.

5 The embodiment of Figure 1 is a sealing system in which the peel seal that is to be formed will be disposed on that side of the reclosable seal that is toward the interior of the package.

10 Figure 2 shows a second embodiment according to the current invention in which the peel seal will be disposed on the exterior side of the reclosable seal. For purposes of the current invention, the two embodiments are otherwise thought to be substantially equivalent. However, users may have reasons for preferring one embodiment over the other. For example, the embodiment of Figure 2 may be more compact, and the embodiment of Figure 1 may prove easier to seal in connection with a step of applying top and bottom film layers 30, 32. According to either embodiment, there will result a single peel seal 26. The type of equipment used in forming the final package also may dictate the embodiment preferred.

15 As an alternative to the embodiments shown in Figures 1 and 2, one may provide that only one of the two profile strips has a strip of peelable material.

20 The current invention applies to two generic types of peel seals, both of which are known in the art. According to one type, the peel seal 26 will fail during opening at some point across its thickness. According to the second type, the peel seal 26 may remain intact when the package is opened, one of the two profile strips simply being peeled away from the peel seal. For purposes of the present invention, this distinction is not important.

25 30 35 40 45 As stated above, the profile strips according to the current invention may be co-extruded together with the walls of the package. In the alternative, as shown in Figure 3, a package 28 may comprise a top film layer 30 and bottom film layer 32 joined by heat seals 34 and 36 to the profile strips 2, 4.

45 50 55 During manufacture, dual profile strips may be formed by making tandem pairs of profile strips, as disclosed in the said EP-A-90304405.5. Also within the scope of the current invention is the option of expanding the strips of peelable material 22, 24 so that they cover substantial portions of the profile strip surfaces on which they are disposed. Indeed, both profile strips of a mating pair may be formed of materials that produce a peelable seal between them, thereby eliminating the separate, discrete elements 22, 24.

While this invention is susceptible of embodiment in many different forms, there is shown in the

drawings and described herein in detail preferred embodiments of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the broad aspects of the invention to the embodiments illustrated.

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Claims

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1. A method of producing a sealing system for a package comprising the steps of:
forming first and second profile strips, each strip comprising longitudinally-extending reclosable seal means of the interlocking type;
adhering a strip of peelable material to at least one of the profile strips substantially parallel to and proximate the reclosable seal means.

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2. The method of claim 1, wherein said forming and adhering steps comprise the step of co-extruding a profile strip and an adhered strip of peelable material.

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3. The method of claim 1,
said forming step comprising the step of forming first and second profile strips each of which comprises a flange element,
further comprising the step of adhering webbing to the respective flange elements, thereby forming opposite sides of a package.

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4. The method of claim 3, wherein said forming step and said adhering steps comprise the step of coextruding a profile strip, an adhered strip of peelable material, and webbing.

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5. A sealing system for a package, the sealing system comprising:
first and second profile strips, each strip comprising longitudinally-extending reclosable seal means of the interlocking type; and
a seal of peelable material disposed between the profile strips and taking the form of a strip extending longitudinally of and proximate the reclosable seal means.

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6. The invention of claim 5 wherein:
said first and second profile strips respectively comprising flange members,
the invention further comprising a webbing adhered to the respective flange elements of said sealing system, the webbing comprising at least one wall of a package.

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7. A resealable profile strip having a peelable material co-extruded thereon.

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